

REMARKS

In the Office Action, the Examiner rejected claims 1-4 and 6-8 under 35 U.S.C. § 103(a) as being unpatentable over Kubo (U.S. Pat. No. 5,722,502) in view of Suzuki *et al.* (U.S. Patent No. 6,625,534). Applicants respectfully disagree with the Examiner's conclusions and respond as follows:

RESPONSE TO REJECTION UNDER 35 U.S.C. § 103

The Examiner rejected claims 1-4 and 6-8 as allegedly being obvious over Kubo in view of Suzuki. Applicants respectfully disagree and traverse this rejection.

The Examiner cites Kubo for disclosing all of the limitations of the pending claims except for the step transmission. (Page 3 of Office Action: "Kubo fails to show a step transmission.") As the Examiner notes, instead of disclosing a step transmission, Kubo discloses a torque distributing mechanism 38 (see Kubo, col. 8, lines 64-66) that is preferably a differential distributing mechanism such as a differential gear.

Applicants respectfully submit that the Examiner may not fully appreciate the difference between a step transmission and a torque distributing mechanism, and incorrectly assumes that one of ordinary skill in the art would modify Kubo by incorporating a step transmission.

As noted above, the structure of the torque distributing mechanism 38 of Kubo is a differential distributing mechanism such as a differential gear, which varies the torque of the output shaft 38c as the torque of the other output shaft 38b varies (see column 8 lines 64-67). The differential gear 38 in Figures 1 and 2 of Kubo has a differential planetary gearing structure with two pairs of bevel gears, which are always in an engaged condition.

Differential gears are well known to persons of ordinary skill in the art, including the differential gear provided in the half rear axles in a vehicle (Kubo, differential gear 12, Fig. 8 and 9), which has one input shaft and two output shafts. In these embodiments, the speed and torque of one output shaft varies as the speed and torque of other output shaft varies. The two output shafts of the differential distributing mechanism 38 are connected to the two motors, 24 and 10 respectively, and the rear wheels 14 of the

vehicle are always driven by the motor 10. That is, the output shaft of differential distributing mechanism 38 cannot drive the vehicle independently.

In contrast, a step transmission is used for a different function. As persons of ordinary skill are aware, the transmission used for motor vehicle can be divided into two categories: (1) the stepped transmission, which works by alternating the gear drives, and (2) the continuously variable transmissions (CVT), which transmits power by using a rubber V-shaped belt. A stepped transmission generally has one input shaft and one output shaft. The gear ratio is changed by shifting with the different engaged gear sets, which have different ratio of gear tooth numbers. When the stepped transmission is in a shifting mode, the gears are in an unengaged condition, thus the power transfer is disconnected. Therefore, whereas the Kubo torque distribution mechanism teaches the importance of maintaining engaged positions, the stepped transmission emphasizes reversible engagement and permits independent driving of the vehicle.

With respect to claim 1 of present application, the auxiliary motor is connected to the crankshaft of the engine and is not connected to the stepped transmission, while the main motor is connected with the stepped transmission. Thus, in addition to not disclosing a step mechanism Kubo does not disclose the feature “a rotor shaft of the auxiliary motor connected with the crankshaft of the internal combustion engine via a drive mechanism” of claim 1, and the operation of the Kubo technology would be inconsistent with this type of connection.

The output shaft of the stepped transmission also drives the vehicle independently or together with the main motor, see control modes (claim 1f) or (claim 1b), thus Kubo also does not disclose above feature of control mode (claim 1f). In addition, because, the power transfer is disconnected during the shifting of the stepped transmission, in this mode (claim 4d), the controller controls the main motor to drive vehicle during shifting. As Kubo does not disclose the shifting of the stepped transmission, Kubo does not disclose the feature of control mode (claim 1d).

In view of the above differences in structure, connection relationship with other elements and operation function between the torque distributing mechanism 38 of Kubo

and the stepped transmission, the torque distributing mechanism 38 of Kubo, a person of ordinary skill in the art would not substitute or modify Kubo by the inclusion of the stepped transmission.

Like Kubo, Suzuki does not render the present claims obvious, and the two references in combination do not render the claim obvious. Suzuki discloses a step transmission in a power train, a control apparatus, and a control method that controls the power to transmit to the wheel by one of driving power sources when the power transmission apparatus fails. Suzuki, however, does not disclose the operation modes for the power system of the hybrid vehicle. Thus, even if Suzuki and Kubo were combined, they would not lead one of ordinary skill in the art to the claimed invention, because Suzuki does not disclose the additional missing elements of Kubo identified above.

As to the natural characteristic of the step transmission, the control apparatus having step transmission cannot provide "a continuously-variable speed change ratio" as suggested by the Examiner in the Office Action, even if it were combined with the power system having a torque distribution mechanism (38) disclosed by Kubo. As noted above, the function of a torque distributing mechanism (differential gear 38) is different from the function of the step transmission. Thus, it would not have been obvious to one of ordinary skill in the art to modify a power system having a torque distribution mechanism (38) of Kubo with the control apparatus having the step transmission.

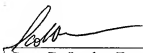
Based on the foregoing, Applicants respectfully submit that one of ordinary skill in the art on reading Suzuki alone or in combination with Kubo would not obtain the currently claimed invention, because: (a) the addition of a step transmission to Kubo would be inconsistent with the mechanisms of Kubo; and (b) even if one were to combine Suzuki and Kubo, one would not obtain all of the elements of claim 1 as identified above. Applicants request withdrawal of the rejection and allowance of the pending claims.

No fee is believed to be due with respect to the filing of this response. If any fees are due, or an overpayment has been made, please charge, or credit, our Deposit Account No. 11-0171 for such sum.

Applicants: Dong, *et al.*
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If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicant's attorney at the telephone number provided

Respectfully submitted,



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